

Legislative Testimony:

AI in Manufacturing

Dr. Amy Thompson, CTO, CCAT

Slide 1 — AI in Manufacturing

Good afternoon, and thank you for the opportunity to be here.

I'm Dr. Amy Thompson, Chief Technology Officer at the Connecticut Center for Advanced Technology, or CCAT, a nonprofit organization that helps Connecticut manufacturers evaluate and adopt advanced technologies to remain competitive.

I'm going to share what we're seeing in AI and manufacturing, why it matters to Connecticut, and what manufacturers need to adopt these technologies responsibly and competitively.

This is a technology issue, certainly. But for Connecticut, it is also much bigger than that. It is an economic development issue, a workforce issue, and ultimately a competitiveness issue for our industrial base and supply chain.

Slide 2 — AI Will Shape Connecticut's Manufacturing Competitiveness

When we talk about AI policy, it is easy for the conversation to focus primarily on regulation.

For manufacturing, we need to look at AI through a broader lens.

AI touches economic development, workforce readiness, technology adoption, infrastructure, cybersecurity and national security. It will influence where companies invest, where they place R&D and production, and whether Connecticut leads or lags in the next generation of industrial innovation.

The key question for Connecticut is not simply, "How do we regulate AI?"

It is: How do we help Connecticut manufacturers use AI responsibly and productively so that they can compete?

Because whether we act or not, these technologies are advancing. If other states create environments that enable responsible AI adoption more quickly, we risk losing

investment, projects, and eventually portions of the supply chain that support our manufacturing sector.

Connecticut has an opportunity to make sure our industrial base is prepared to move with that change.

Slide 3 — AI Can Help Connecticut Manufacturers Compete

Connecticut is starting from a position of strength. We have more than 4,500 manufacturers and an incredibly sophisticated industrial base.

But look at the structure of that base: 61 percent of our manufacturers employ fewer than 50 people.

That matters enormously when we talk about AI. Most Connecticut manufacturers are small and mid-sized businesses. They often face the greatest challenges in adopting new technology, attracting AI and data talent, and absorbing the costs and risks associated with experimentation.

A large manufacturer may have teams dedicated to data, cybersecurity, automation and emerging technology. A 50-person supplier generally does not.

Today, only 27 percent of Connecticut manufacturers report that they have integrated AI technologies. At the same time, 82 percent report difficulty finding and retaining workers.

That combination creates an enormous opportunity.

AI can help companies improve productivity, make better use of scarce talent and strengthen their competitiveness.

Here's the question I'd ask you to keep in mind today:

How quickly can a 50-person manufacturer go from hearing about an AI technology to safely putting it into production?

That is the adoption challenge we need to solve.

Slide 4 — AI Moving From Pilots to Production

We're already seeing that challenge evolve.

A few years ago, the conversation was largely, "Should manufacturers be using AI?"

Today the question is increasingly, "How do we make it work at scale?"

The conversation has shifted from "Should we use AI?" to "How do we use it effectively, safely, and at scale?"

But there is a big difference between demonstrating an AI tool and embedding it into an actual production environment.

The real value comes when AI becomes part of manufacturing workflows: quality inspection, predictive maintenance, production scheduling, process optimization, machine monitoring, or assisting workers with better information.

So the race is moving from experimentation to implementation.

The companies that develop the ability to evaluate, validate and operationalize AI successfully will be positioned to compete more effectively in both domestic and global markets.

Slide 5 — Manufacturing Is Built on Safety and Process Control

Manufacturing gives us a valuable perspective on responsible AI.

Manufacturing environments already operate under rigorous safety standards, regulatory requirements and process controls. Manufacturers test processes, qualify equipment, monitor systems and establish acceptable operating limits. Those disciplines are extremely relevant to AI.

On a shop floor, technology interacts with physical systems: machines, tooling, materials and people.

A bad answer from an office application might cost someone time.

A bad decision in a manufacturing environment can cause scrap, damage equipment, stop production or create a safety issue.

But manufacturers understand this.

In many ways, AI represents the next evolution of modeling and analytics that manufacturers have used for decades to improve quality, predict outcomes and optimize performance.

It is also important to distinguish industrial AI from many consumer-facing AI concerns. Manufacturing applications are typically focused on operations, maintenance, scheduling, quality and productivity improvements within controlled environments.

The goal should not be uncontrolled adoption. It should be disciplined, responsible adoption that still allows innovation to move forward.

Slide 6 — AI Adoption Depends on Manufacturing Readiness

One thing we're seeing consistently is that the barrier is not a lack of interest in AI.

The barrier is readiness. Many manufacturers are still working through a fundamental challenge: getting operational data into usable digital form and creating the connected infrastructure that allows AI systems to generate value.

You cannot simply add AI to a factory and expect it to create value.

You need usable data. You need connected systems. You need secure infrastructure. And you need people and processes capable of using the information AI produces.

For many small and midsized manufacturers, even getting manufacturing data digitized and accessible is still a challenge.

And in Connecticut's defense supply chain, there is another layer: where that data resides, who has access to it and how it is protected. That creates additional complexity for manufacturers adopting digital and AI technologies.

That's why investments in areas like digital thread, cybersecurity, connected manufacturing systems and workforce skills are so important.

They are not separate from AI.

They are the foundation that makes AI possible.

Slide 7 – Intro to Digital Thread Lab

The CCAT Digital Thread Lab at our headquarters in East Hartford helps manufacturers explore how digital technologies connect data, processes, and people across the entire product lifecycle.

At CCAT, we view the Digital Thread as a strategic enabler. By creating a trusted digital foundation across the enterprise, it improves visibility, accelerates decision-making, and helps manufacturers unlock the full value of AI and other advanced technologies.

As manufacturers continue their digital transformation journeys, the Digital Thread provides the connected, reliable data needed to move from isolated systems to intelligent, data-driven operations.

Slide 8 – Beyond the Thread: Governance and Trust

Connecting information through a digital thread is an important step, but connection alone does not create trust.

As manufacturers begin using AI to interpret that information and support decisions, they also need to understand where an answer came from. Which model was used? What data and context informed it? What assumptions were made? Can the result be reproduced, and how was it validated?

Those questions become especially important in manufacturing, where decisions can affect quality, production, equipment and safety.

And there is a human dimension as well. A digital thread can preserve data and create organizational memory, but it does not automatically capture the experience and judgment of the people who understand why a process works the way it does.

So responsible AI adoption requires both: connected information **and** the governance, validation and human expertise needed to trust how that information is used.

Slide 9 – Closing the AI Adoption Gap is Key to Connecticut's Competitiveness

AI adoption is not happening at the same pace across manufacturing. More digitally mature companies are moving toward integration and scale, while many small and midsized manufacturers are still in the experimentation and pilot stages.

That matters in Connecticut because smaller manufacturers make up such a large part of our industrial base.

If we can help more of them move from experimentation to safe, productive AI adoption, we strengthen the competitiveness of the entire manufacturing supply chain

Slide 10 — Automate Tasks, Not People

Let's turn to workforce.

The key message here is simple: automate tasks, not people.

Manufacturers across Connecticut continue to report significant workforce challenges. AI is often less about replacing workers and more about helping companies do more with the skilled people they already have.

There are repetitive, labor-intensive and data-driven tasks that technology can perform very effectively: machine tending, material movement, inspection, data collection, documentation, scheduling and routine analysis.

When we automate those tasks, we create the opportunity to move people into higher-value work.

That might mean process optimization, robotics programming, advanced quality, systems integration, troubleshooting or supervising increasingly sophisticated production systems.

I do not think the future of manufacturing is people or technology.

It is people working with technology.

That future requires more than engineers and data scientists. It also requires technicians, operators, supervisors, and business professionals who understand how to use AI-enabled tools and interpret AI-driven information.

We see tremendous interest from students when they encounter robotics, digital technologies, and AI. That is an opportunity for Connecticut as we think about attracting and preparing future talent.

This is why collaboration among manufacturers, community colleges, universities, K-12 programs, and organizations like CCAT is so important.

Slide 11 — What Connecticut Can Do

So what does this mean for Connecticut?

The priority should be enabling responsible adoption.

That means creating a business-friendly environment that supports innovation while maintaining appropriate cybersecurity, data governance, and protections where people and sensitive information are involved.

Help manufacturers move from awareness, to assessment, to pilots, to production, and ultimately to scale.

Support the development of AI-capable technicians, engineers, and manufacturing technologists.

Continue building the digital and data infrastructure these technologies depend upon, especially for small and midsized manufacturers that may lack internal resources to build those capabilities on their own.

And importantly, give manufacturers places where they can see and test technologies before making a major investment.

Regulatory clarity also matters. When companies are uncertain about future requirements, they often delay investments or shift pilot projects elsewhere.

We should absolutely be thinking about responsible controls.

But we should design the environment in a way that also allows Connecticut companies to innovate, invest and grow.

The goal is a stronger, safer, more innovative and more competitive manufacturing base that keeps investment and opportunity here in Connecticut.

Slide 12 — CCAT Supports Manufacturers Move From AI Awareness to Adoption

This is where organizations like CCAT help bridge the gap between awareness and adoption.

CCAT operates as a nonprofit, unbiased resource where manufacturers can evaluate technologies in a neutral environment rather than through a vendor sales pitch.

Our role is not to tell a manufacturer that every new technology is right for them.

In fact, sometimes the answer is that it is not.

We provide a neutral place where manufacturers can understand what is possible, evaluate benefits, risks and implementation requirements, test technologies, develop implementation plans, and train their people.

We work with manufacturers that may not have their own AI lab, robotics lab or digital transformation team.

They can see technologies demonstrated, compare alternatives, understand potential return on investment, and build a practical adoption roadmap before committing significant resources.

That makes advanced technology much more accessible to the small and midsized companies that make up so much of Connecticut's manufacturing base.

Slide 13 — Autonomous Cell System Architecture

Here's what that looks like in practice.

What you are looking at is an autonomous manufacturing cell.

This is not AI operating by itself.

It is AI working within a broader engineered system that includes automation, controls, sensors, manufacturing data and human oversight.

The system can monitor what is happening, detect a condition, make a decision within defined boundaries, and take corrective action.

That is an important distinction.

When we talk about manufacturing AI, we are often talking about AI embedded within a larger engineered system, alongside traditional controls, automation, and human oversight.

At CCAT, manufacturers can actually see those systems working together rather than trying to understand them from a software demonstration or a PowerPoint presentation.

Slide 14 — From Shop-Floor Data to Better Decisions

At its simplest, this is what the process looks like.

Something is happening in a machine or manufacturing process.

We collect data from it.

We create a digital representation of what is happening. This is the foundation of a digital thread, where information can flow across equipment, systems, operations, and decision-making processes.

AI can then analyze that information to identify patterns, detect anomalies, and support operational decisions.

And that insight leads to action.

That might mean alerting an operator before a quality issue occurs. It might mean predicting a maintenance problem before a machine goes down. Or it might mean identifying an opportunity to improve a process.

The goal is not AI for the sake of AI.

The goal is a better manufacturing decision: less downtime, less scrap, better quality, greater productivity, or a safer process.

That is where the value is.

Slide 15 — Connecticut Can Lead the AI Revolution in Manufacturing

I'll close with this thought:

Connecticut already has the manufacturers, supply chains, talent and innovation ecosystem to lead in industrial AI.

The answer will depend on how effectively we connect technology adoption, workforce development, digital infrastructure, and supportive public policy.

Connecticut already has a strong foundation: world-class manufacturers, a robust supply chain, higher education partners, and an innovation ecosystem that supports technology adoption.

The opportunity now is to connect and make responsible AI adoption accessible, particularly for small and midsize manufacturers.

We do not need manufacturers to chase every new AI technology.

We need to give them the capability to understand it, test it, validate it and use it where it creates real value.

CCAT has spent more than two decades helping manufacturers evaluate and adopt advanced technologies, and we would welcome the opportunity to show you what this looks like in practice.

I invite you to visit CCAT, meet our team, see our Digital Thread Lab and autonomous manufacturing cell, and speak directly with the engineers and technicians using these technologies in a real Connecticut manufacturing environment.

Thank you.